

O. H. M. S.

Wy Gerald Deputy Minister.

LABORATORY

OF THE

INLAND REVENUE DEPARTMENT

OTTAWA, CANADA

BULLETIN No. 193

LARD



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OTTAWA, December 3, 1909.

W. J. Gerald, Esq., Deputy Minister of Inland Revenue.

SIR,—I beg to hand you a report covering the results of examination of 70 samples purchased as Lard, throughout Canada, in September and October last.

Lard has on two former occasions been made the subject of Inspection by this department, viz.: in August and September of 1888 (See Bull. 7) and in December of

1907 and January of 1908 (See Bull. 147).

Referring to Bulletin 7, I find that the inspection of 1888 was consequent upon 'numerous prosecutions for selling adulterated lard which have, within the last twelve months, taken place in England.' The report in question deals with 109 samples, and 66 per cent. of these are found to be adulterated under the Act, by admixture with, and substitution of an inferior article. This inferior article is Water in 12 samples, and cotton seed oil, or stearin in 61 samples. Of this collection 38 samples were Canadian made, 60 samples were American made, and 11 samples were of unknown origin. All but one of the American lards contained cotton seed products, while only three Canadian lards were found to contain cotton seed oil. The late Chief Analyst remarks: 'There are to be found a few cases, from which it would seem that our manufacturers are beginning to imitate American practices.'

At the date of this report (1888) the use of cotton seed oil in lard manufacture was comparatively a new thing. The importance of inspectoral work under the Adulteration Act is well illustrated by the fact that, while 66 per cent of the samples examined in 1888 contained cotton seed oil without acknowledgment, subsequent inspections show that the sale of a cotton seed oil containing article, as lard, is now quite an exceptional occurrence. The intermixture of cotton seed oil continues, but the product is sold as a compound, and conforms to Section 24 (d) of the Act. The inspection of 140 samples in February, 1908, showed only two (2) to contain cotton

seed oil, without acknowledgment of the fact.

The present report dealing with 70 samples, shows five (5) samples, sold as

genuine, to contain cotton seed oil.

No objection on the ground of wholesomeness, can be taker to the admixture of cotton seed oil in factitious lards, or lard substitutes; but the sale of an article con9890—11

taining cotton seed oil, as a genuine lard, constitutes adulteration under section 3 (a) (b) of the Act. Among samples now reported, eighteen give more or less distinct indications of cotton seed oil (Halphen test); but these are not sufficiently definite to justify the conclusion that there has been purposeful addition of the article. It is known that hogs which have been fed on cotton seed meal may yield a fat capable of reacting to the Halphen test; and imperfect cleaning of machinery which had been used in manufacturing a compound lard, might easily result in such slight admixture with cotton seed oil as is indicated by the reactions found.

Adulteration by the addition of water to lard, seems to be a thing of the past. In 1888, 11 per cent of the samples examined contained water in excess, the amount varying from 5.55 per cent to 24.47 per cent. One per cent of water in lard is a reasonable maximum allowance, so that the incorporation into lard of the large amounts found in 1888, was a palpable fraud, and required considerable skill in its execution. In 1908 we found one market sample (out of 140 examined) to contain 1.36 per cent of water, evidently by accident since other samples made by the same firm, gave only traces of water. The inspection of 70 samples now reported, shows only one sample to contain as much as 1.18 per cent water, which is barely above the limit quoted and

recommended to be made legal.

The use of tallow in the manufacture of compound lards is believed to be not uncommon. The chemical and physical constants for beef and mutton tallow so closely approximate those for ordinary hog fat as to make it difficult for the analyst to assure himself of the presence of tallow. Among many methods of examination, that have been published during recent years, all of which methods have been studied in this laboratory, the most promising seems to be that described by Dr. J. A. Emery, of the U. S. Hureau of Animal Industry (Circ. 132). This depends upon the exact determination of the melting point of the stearins, crystallized out from an ether solution of the fats. The melting points referred to have been determined with great care by Mr. C. C. Forward, of this laboratory, and are inserted in the column headed 'Melting points of solid glycerides.' Although very suggestive in many instances, I do not regard the evidence afforded by them as sufficiently conclusive to justify positive deductions. The method is probably capable of greater retinements than it has yet received, and is being studied with a view to giving its results a greater degree of positiveness than is yet possible. A memorandum by Mr. Forward is appended, giving some results of such investigation as he has made. The conditions under which the solid glycerides are obtained in greatest purity, that is, as free as possible from oleins, are not easily secured. It may be that recrystallization of these would yield crystal having better defined melting points. The matter is being further investigated; and I trust that we may yet be able to obtain a working method that shall enable us to detect with certainty the presence of tallows.

I beg to recommend the publication of this report as Bulletin No. 193.

I have the honour to be, sir,

Your obedient servant,

A. McGILL, Chief Analyst.

Note.—Correspondence with vendors and manufacturers of lard, since writing the above, seems to justify the addition of a note calling to the attention of vendors the importance of the sale of an article for just what it is. It is quite clear that several retail dealers in lard, whose names appear in thi Bulletin, purchased compound lards, plainly marked as such by the manufacturers, and purchased about four cents per pound below the prices of lard. These dealers surely knew that it was not lard which they bought, but compound lard, a substitute for the real article. Many of them sold the article to our inspectors stating it to be compound lard; but others sold it as lard, with no explanation. In this case the vendor is clearly responsible for selling an adulterated article, and is amenable to the penalties imposed by the Act.

The labelling of a factitious article as Family Lard, is not a statement of its compound character, and gives no warning of its sophistication to the purchaser.

MEMORANDUM.

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ns to rticle thi at which our case posed The method of Emery (Circ. 132, Bureau Animal Industry, U. S. Department of Agriculture) for detection of tallow in lard consists in crystallizing the solid glycerides from the sample of fat by maintaining at a temperature of about 17.5° for 18 Lours, a 20 per cent solution (weight volume) of the fat in ether; and the subsequent determination of the melting point of the crystals obtained after washing with cold ether and drying.

In applying this method to the present collection of market lards a numbe difficulties were experienced. It was found in determining the melting point that the error due to variations in manipulation might amount to half a degree (centigrade); and that the error due to variations in the temperature of the crystallizing bath (between 15° and 20° C.) might amount to one degree. As the difference between the melting point of the crystals from pure lard and those from pure tallow is not over three and a half degrees, it is evident that the range of error must be greatly reduced in order to obtain conclusive results.

In further work a slight alteration was made in the melting point apparatus, viz., the substitution of sulphuric acid (1.3) for water in the inner compartment and also heating the bath more slowly. This was found to lessen the range of error to some extent, at the same time giving slightly higher results in all cases.

Sixteen samples of apparently pure lard (i.e., lard having Iodine number 55-60, and Butyro-refractometer reading 50°-51° and containing no cotton seed oil) gave as a maximum melting point of glycerides 64·4°, a minimum of 63·5°, and an average of 64·0°. The following results were obtained with home rendered pure leaf lard and tallow:—

Pure l	eaf lar	d																				63.0	Q.
44	66	4	per	cent	tallow			Ĭ			•	ì		•				*	•	*	•	63.	50
166	66	8		66	66		•		•		·	•	•	•	 •	۰	•		•			63.6	70
6.6	66	10		66																		62 6	
66	44	15		66																		62.8	
Pure t	allow.												•	•				•			•	60 .	3.

Investigatory work is still in progress along the following lines. Maintaining the temperature constant to 0. 2° C., during the 18 hours of crystallization at 17° or 18° C. whichever is found most satisfactory. Exact conditioning of the melting point determination with special reference to size of capillary tubes, initial temperature and time of heating and one or two modifications in the thermometer and bath used.

It is hoped that the total range of error on any sample of land tested may be so reduced as to make it possible to detect with certainty an adulteration of less than 10 per cent tallow.

CHARLES C. FORWARD.

Cost. Name and A	
Name and Address of Vendor.	sher y the
DISTRICT OF NOVA	SCOTIA-
C. S. Davis, Halifax, N.S 11 lb. 26 Langs Packing C	o., Montre
J. H. Emmett, Halifax, N.S. 11 " . 27 Vendor	
DeWolfe & Lamont, Kent-11 27 F. W. Fearman, ville, N.S.	Hamilton.
John Riley, Windsor, N.S 11 " . 30 Swifts, Chicago	
The 2 Barkers Ltd., Amherst, 11 27 Wm. Davies, Tor N.S.	ronto
DISTRICT OF NEW BRU	NSWICK-
Peters & Rice, St. John, N.B 2 lbs. 34 F. W. Fearman,	Hamilton.
Slipp & Flewelling, St. John, 11 lb . 27 Vendors	
N.B. B. H. Smith & Sons, Wood- 11 26 H. F. Randolph	h & Son
stock, N.B. W. H. Culbert, Sussex, N.B. 12 30 Fredericton, N. John P. Squire &	Co., Bosto
The 2 Barkers Ltd., Moncton 1 26 The Wm. David Toronto.	es Co. Ltd
DISTRICT OF	QUEBEC
Jos. A. Deschene, St. Ursale 11 lb . 23 Chevalier Poulion	t, Joliette.
A. Plante, St. Léon 13 24 Davis, Montreal.	
W. Duhaime, St. Paulin 11 23	
Dordré Dho, St. Alexis 11 21 L. Chaput fils &	Cie, Montr
J. V. Milot, St. Alexis 11/2 26 al	10
DISTRICT OF ST. HYA	CINTHE
J. W. Turcott, Drummond 1 lb 18 The Laing Pack ville.	ing & Pro
ville. J. St. Pierre, Actonvale 14 Gunna, Ltd., Mon	
Alph. Bellard, Waterloo 3 lbs 45 Vendor	
D. M. Matheson, Lake Me- 3 55 The Whyte Pac	king Co.
gantic. R. G. Brodeur, St. Hya-1 lb 16 Stratford. Lainge Montreal	

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Income de Name		Rass	LTS OF	ANALYSI	8.	1			
Inspector's Report. (Is not an expression of opinion.)	Mater. Iodine Number. (Hanus.) Butyro Re- fractometer fractometer of Solid Glyoerides. Glyoerides.		Number of Sample	Remarks and Opinion of the Chief Aualyst,					
R. J. WAUGH, INSPEC	CTOR.						-		
	p. c.				1				
***************	None	65.9	51.7		Styne	41836	Genuine.		
Kettle rendered	0.50	56.5	50.0	61.1		41837			
Labelled Pure Lard	None	62.9	51.0	War.	Light red.	41838			
'Silver Leaf' Pure Brand.		66.7	51.5	64'4	Neue	41830			
Labelled Pure	н	60.6	50:4	63.0	н .,,,	41840			
J. C. FERGUSON, INSP	ECTOR.			<u> </u>					
Star Brand Pure	None	60.4	50.9	64.0	None	39573	Genuine.		
		55.4	49.5	63.7	"	39574	10		
'Silver Leaf' Guaranteed Pure.		65.4	51.2	64.2		39575	lt.		
Pure						39576	Sample lost in trans		
"	None	61.0	50.5	63·1	None	39577	(Railway collision Genuine.		
E. BELAND, INSPECTO			I		1 1		1		
	N. ne	65.9	51.4		None	36642	Genuine.		
**** *** ***** ****		61.3	51.0	63 4		36643			
		61.8	50.6	62.9		36644	10		
	n	55.6	49.5	63.8	11	36645	10		
		58.8	50.1	64.0	17	36646	00		
. C. ROULEAU, INSPE	CTOR.								
Extra Pure Lard	0.13	62.4	50.9	64:2	Faint red.	1239	Genuine.		
ox marked Gunn's Easifirst N Shorten'g, Excels all others		83·2 58·4	55.0		Deep red.	1240	Contains Cotton see oil. Adulterated.		
abelled Pure Lard.		63.0			None		Genuine.		
ompound			51.0	63.8	"	1242	"		
	"	93 4	56.7	61.6	Deep red.	1243	Contains Cotton see oil. Sold as Com pound.		

No	*****	mple.	Name	Cos	т.	Name and Address
Nature of Sample. To Land			and Address of Vendor.	Quantity.	Cents.	of Manufacturer or Furnisher as given by the Vendor,
					DIS	STRICT OF MONTREA
9.						
2 Lard		40301	Wilfrid Bleau, 168 Plessis St.	1½ lb	22	Canada Packing Co., Mo
3 "	/	40302	Montreal. T. A. Berube, 338 Colonial	11	24	treal.
3		40303	Ave., Montreal. T. L. Hodgson, 385 Laval	11	27	Whyte Packing Co
4		40304	Ave., Montreal. P. Brunet, 697 Mount Royal	11	26	L. Chaput fils & Cie
4 "		40305	Ave., Montreal. A. Boyer, 230 Dufferin St., Montreal.	11/2	26	Unknown
]	DISTRICT OF OTTAWA
24 Lard		42821	A. Sweet & Co., Winchester.	1½ lb.	27	The Geo. Matthews Co. Ltd
28		42822	C. Carmichael, Spencerville		27	Hull.
5 "		42823	Miss Smith, Ottawa		17	Park Blackwell Co. Ltd., T
5		42824	Wall & Co., Ottawa	11	27	Wight & Co., Toronto
5		42825	The Geo. Matthews Co. Ltd., 96 Queen St., Ottawa.		27	Vendors, Hull, P.Q
			1		DI	STRICT OF KINGSTON-
7 Lard.		42736	Anderson Bros., Kingston	11	25	Vendors
7		42737	J. Redden, Kingston	11	25	Wm. Davies, Toronto
7 "		42738	Wm. Davies, Kingston	11	25	H 10
9		42739	Mason Co., Peterboro	11	25	Fowlers, Hamilton
9		42740	Matthews Co., Peterboro	11	27	Matthews, Peterboro
					D	ISTRICT OF TORONTO-
13 Lard		41382	E. H. Wilson & Co., Mark-	1½ lb.	24	The Wm. Ryan Co., Ltd
15		41383	J. C. Mossington, Orillia	11	25	Toronto. The Ingersoll Packing Co
16		41384	C. Beck Mfg. Co., Ltd	13	25	Ingersoil. The Park Blackwell Co., Ltd
24 "		41385	A. S. Cain, Dundas	11	25	Toronto. F. W. Fearman Co., Ltd
27 "		41386	P. D. Dunn, 1646 Queen St. West, Toronto.	11	27	Hamilton. The Wm. Davies Co., Ltd Toronto.

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		Rest	ULTS OF A	Analtsis	s.	ple.	
Inspector's Report, (Is not an expression of opinion.)	Water.	Water. Iodine Number. (Hanus.)		Melting point of Solid Glycerides.	Halphen Reaction.		Remarks and Opinion of the Chief Analyst.
J. J. COSTIGAN, INSE	PECTOR.				-		
	р. с.		1	-	1		
Sold as Pure, Tub labelled Choice Family Lard.	0 52 None	85.2	55.4				oil. Adulterated.
Labelled Pure Lard		61.3	51.2	64.4		40302	" "
		63.3	51.1		None		
Sold as Pure		57.8	50.2	63.9	11	40304	
J. A. RICKEY, INSPEC	CTOR.		1		1	10000	1
Sample from Pail marked	None	55.3	50.0	62.0	None	42821	la :
Pure Lard.	н .,,	56.2	20.0	63 2	Faint pink		Genuine.
Labelled Choice Family Lard 'Silver Leaf.'		60.3	51.0	63.7	Pink	42822 42823	11
		61.9	51.0	64.4	None	42824	fe ·
Sold as Pure Lard	"	56.9	50.0	61.7	Light pink	42825	0
JAS. HOGAN, INSPECT	ror.	1					
	0.12	53.5	50.0	63.8	None	42736	Genuine.
	0.26	58.6	50.6	64.1		42737	11
	None	58:0	50.2	64.1		42738	11
	1.18	62.5	50.9	63:5		42739	Genuine: Water con-
	None	56.1	49.8	63.9	9	42740	tent rather high. Genuine.
L. J. DAGER, INSPECT	OR.						
abelled Pure Lard	None	64.5	51.4	63-8	Light red	41382	Genuine.
Beaver' Brand Pure Lard.	н	55.8	49.8		None	41383	II .
hoice Family Lard	11	61.2	51.7		Pink	41384	п
Star' Brand Pure Lard .		59.0	50.8	63.0	н	41385	**
ure Refined Lard	**	60.4	50:7	64.4	None	41386	

	T.	Cos		eš				
Name and Address of Manufacturer or Furnisher as given by the Vendor.		Quantity.	Name and Address of Vendor.	Nature of Sample. To Laquin N			Date of Collection.	
DISTRICT OF LONDON	1							
						09.	1909	
J. & A. McHardy, Guelph	26	11	Mr. McHardy, Guelph	30845	Lard	. 20	Sept.	
A. M. Smith, London	26	11	Hodgins & Bedgood, Blythe.	30855		22	19	
Ingersoll Packing Co., Ingersoll.	26	14 " .	D. M. Gordon, Wingham	30860		22	11	
Fowlers & Co., Hamilton	50	3 ".	Benson Bros., Guelph	30865	19	27	10	
White Packing Co., Stratfo	25	11	Jackson & Son, Guelph	30866		27		
STRICT OF WINDSOR	D							
Park Blackwell Co., Toron	Nil.	11	A. J. Clark & Co., London	42648	Lard	11	Oct.	
Davies Co., Toronto	27	11	W. E. Humphries, London	42649		11	**	
Ingersoll Packing Co., Inge	26	11	Pinney Bros. & McIntosh,	42650		11	19	
soll. Unknown	27	11	J. Straitch, London	42651	"	11	11	
Davies Co., Toronto	27	1½	Mrs. Geo. Armstrong, London	42652	0	11	18	
TRICT OF MANITOBA	DIS							
J. Y. Griffin & Co., Winnip	25	13	S. Goddard, Winnipeg	39811	Lard	. 13	Sept.	
Gordon & Ironside, Winnip	30	11	W. B. Francis, Winnipeg	39812	и	14	0	
10 11	27	14	Moffet & Douglas, Winnipeg	39813	11	14	19	
Gallagher, Holman & I france, Winnipeg.	30	11	J. Bower & Co., Brandon	39814	0	21	**	
Gordon & Ironside, Winnip	30	11	W. A. Bartram, Winnipeg.	39815		24	15	
STRICT OF CALGARY	DI							
Vendors	60	1½ lb	P. Burns & Co., Calgary	35622	Lard	. 14	Sept.	
J. Y. Griffin & Co., Calgar	50	14	C. Wourull & Co., Calgary	35623	и	14	11	
99 B1	60	14	Farmers Meat Market, Cal-	35624		14	11	
	55	18	Dominion Meat Co. Ltd.,	35625		15	11	
Vendors	-	-	Calgary.					

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Y		RESU	LTS OF	Analysi	B.	ple.			
Inspector's Report. (Is not an expression of opinion.)	Water.	Iodine Number. (Hanus.,	Butyro Refrectometer	Melting point of Solid	Halphen Reaction.	Number of Sample.	Remarks and Opinion of the Chief Analyst.		
T. KIDD, INSPECTOR									
	p.c.								
	None	58.7	50.3	62.7	None	30848	Genuine.		
	и	61.8	51.0	64.6	"	30855	10		
	"	57.8	50.1	64.3		30860	- "		
	15 ,,,	61.2	50.7	64.1		30865	10		
	"	57.8	50.0	63.7		30866	86		
NO. TALBOT, INSPEC		54.4	50.2	63.3	Faint pink	40040	la .		
withdrawn from sale by Mr. Clark. avies Pure rendered Lard		59.1				42648	Genuine.		
abelled Pure Lard with			50.1	64.4	None	42649	11		
Beef Fat.		53.6	49.5	62.3		42650			
ure Lard	0	59.4	49.9	64.4	"	42651	11		
	"	00 4	30 .,	64.3	11	42652	10		
. C. LARIVIERE, INS	PECTOR	•							
	None	64.8	51.4	61.7	Light red.	39811	Genuine.		
	0.16	62.6	50.9	62.0	Pink	39812	W		
	0.13	61.4	90.9	62.5		39813	н		
	None	61.4	20.9	63.8		39814	**		
	*	59.6	50.5	61.6	11	39815	**		
W. FLETCHER, INSI	PECTOR.				1	- (
	0.12	64.2	51:1	64.2	None	35622	Genuine.		
	lone	68.1	52.0		Deep red.		Contains Cotton see		
		64-8	51.3		None		oil. Adulterated. Genuine.		
	0.14	63.2	51.0	64.4	H .verel	35625	H .		

tio.			aple.		Cos	т.	Name and Address			
Date of Collectio.		Nature of Sample.	Number of Sample	Name and Address of Vendor.	Quantity.	Cents.	of Manufacturer or Furnisher as given by the Vendor.			
					D	IST	RICT OF VANCOUVER-			
190	9.		and the state of t							
Sept.	22	Lard	37763	P. Burns & Co., Vancouver, .	1 lb	30	Frye Bruhn Co., Seattle			
11	22		37734	B. C. Market Co., Vancouver	11	30	Verdors			
11	22	"	37765	P. Burns & Co., Vancouver.	11	40	P. Burns & Co., Calgary			
**	22		37766	Avenue Meat Market, Van-	11	30	J. Y. Griffin, Vancouver			
**	23	a	37767	London Meat Market, Van- couver.	11	25	Vendors			
		1		l.		DI	STRICT OF VICTORIA—			
Oct.	14	Lard.	41569	Windsor Grocery Co., Vic-	1½ lb	20	J. Y. Griffin & Co., Victoria			
ti	15		41570	toria, B.C. Saunders Grocery Co. Ltd.,	11	50	J. Y. Griffin & Co., Winni-			
19	15	** ************************************	41571	Victoria, B.C. Wm. B. Hall, Victoria, B.C.	11/2 " .	30	peg & Edmonton. The Frye Bruhn Co., Seactle,			
11	15		41572	Dixi H. Ross & Co., Victoria,	11	40	Wash.			
11	18		41573	J. Renouf, Victoria, B.C	11/2	25	J. Y. Griffin & Co., Victoria.			
		Pure Leaf Lard.	Steam	rendered from Kidney fat only			1			

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Inspector's Report. (Is not an expression of opinion.)	Water. Iodine Number.		Butyro Re- fractronseter at 40° C.	Melting point of Solid Glycerides.	Halphen Reaction.	Number of Sample.	Remarks and Opinion of the Chief Analyst.
J. F. POWER, INSPEC	TOR.						
1:	р. с.	3			1		
'Wild Rose' Brand Label- led Pure.		65.3	51.2	64.2	Faint pink	37763	Genuine.
Guaranteed Absolutely Pure.	11	68.3	51.9	64.4		37764	11
'Shamrock' Brand	10	66.2	51.2	64.4	None	37765	11
******************		79.1		61.2	Deep red		Contains Cotton seed
	0 ,,,	59.8	50.2	61.9	None		oil. Adulterated. Genuine.
D. O'SULLIVAN, INSP	ECTOR.						
Labelled Pure Lard	None	65.4	51.4	64-1	None	41569	Genuine.
Labelled 'Griffins' Pure	0.12	65:4	51.2	64:5		41570	
Lard. Wild Rose' Pure Lard	None	67:5	51.5	61.5	T		11
Labelled Pure Lard		67:1			Light pink	41571	11
			51.6		Light red.	41572	11
" "	"	64 7	51.2	62.7	None	41573	19
	None	52.0	49.0	63.9	None.		